

Docket No. SON-1159/REISSUE
Serial No. 10/050,537

REISSUE APPLICATION

REMARKS

This Amendment is being submitted in response to the initial Office Action on the merits dated December 3, 2002. Reconsideration of the rejections stated in the Office Action is respectfully requested in view of the foregoing amendments and the following remarks.

As an initial matter, it is noted that an Information Disclosure Statement (“IDS”) was filed in the PTO on November 26, 2002, to bring to the Examiner’s attention two additional references cited in the Applicants’ corresponding European application. That IDS was not made of record by the Examiner in the first Office Action, and an initialed copy of the PTO Form 1449 has not yet been returned. Accordingly, it is respectfully requested that the Examiner consider these additional references and return an initialed copy of the PTO Form 1449 to make these references of record with the next Office communication.

The Rejection of Claims 7, 12 and 13 Based on JP ‘956 and JP ‘561

Claims 7, 12 and 13 stand rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Japanese Publication No. 51-118956 (“JP ‘956”). Claims 7 and 12 stand rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Japanese Publication No. 50-106561 (“JP ‘561”). The Examiner contends that the JP ‘956 and JP ‘561 references disclose each and every feature recited in these claims. To the extent that these rejections might still be applied to the claims as amended, they are respectfully traversed for the following reasons.

Claims 7 and 12 have been amended to change the phrase “a glass bulb” in line 2 into --a glass bulb having a skirt portion--. A corresponding change was also made

by this Amendment to the specification in the paragraph beginning at column 4, line 62. The skirt portion of the face plate 10 refers to the portion of the face plate 10 that projects rearwardly from the front face portion of the face plate 10. That is, the face plate 10 has a substantially flat front face portion formed integrally with a rearwardly projecting "skirt portion."

The JP '956 and JP '561 references appear to disclose face plates having flat front face portions and flat inner sides, but not the rearwardly projecting skirt portions, as in the Applicants' invention. Without the skirt portions, the face plates disclosed by these references are merely flat glass panels that are bonded to the front edge of a funnel to form the CRT. Such flat glass panels do not provide the increased resistance to mechanical shock damage and anti-explosion strength achieved by the Applicants' claimed invention.

Accordingly, reconsideration and withdrawal of the rejections of claims 7, 12 and 13 under 35 U.S.C. 102(b) based on the JP '956 reference and the JP '561 reference are respectfully requested.

The Rejection of Claims 1 to 4, 10 and 12 Based on JP '710

Claims 1 to 4, 10 and 12 stand rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Japanese Publication No. 06-0367710 ("JP '710"). Claims 1 to 4 have been canceled. To the extent that this rejection might still be applied to claims 10 and 12 as amended, it is respectfully traversed for the following reasons.

The JP '710 reference discloses a CRT in Fig. 1 having a face plate 1 with a substantially flat external display area 11, a concave internal surface 3, and a color selection mask 2. The color selection mask 2 has a curvature projected toward the face

plate 1 which appears to be virtually the same as the curvature of the concave internal surface 3 of the face plate 1.

Applicants' claim 10 recites, among other things, the following limitation:

said projected curvature of the color selection mask being larger than the recessed curvature of the internal surface of the face plate

This limitation is not satisfied by the JP '710 reference. Specifically, there is no teaching or suggestion in the JP '710 reference of the color selection mask 2 having a curvature that is "larger" than the curvature of the concave internal surface 3 of the face plate. The Applicants respectfully disagree with the Examiner's statement on page 4 of the Office Action that the curvature of the color selection mechanism 2 in the JP '710 reference is larger than the curvature of the internal surface 3 of the face plate. The Examiner appears to be relying on a perceived minute difference in the illustrated curvatures of the color selection mechanism 2 and the internal surface 3 shown in Fig. 1 of the JP '710 reference. However, it is respectfully submitted that such minute differences in the curvatures, if they exist at all, are merely the result of a lack of absolute precision in the preparation of the drawings. The illustrated curvatures are so near identical that any perceived differences would require an explanation in the text of the JP '710 reference to be considered a prior art teaching of the claimed different curvatures. The text of the JP '710 reference does not provide any such teaching.

With regard to claim 12, the JP '710 reference fails to teach or suggest a CRT having a face plate with an effective display area that is substantially flat, and a thickness that is substantially uniform. Specifically, claim 12 recites, among other things, the following limitation:

a glass bulb having a skirt portion in which an external surface of an effective display area of a face plate is substantially flat and a

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thickness of the effective display area of the face plate is substantially uniform

In contrast, the JP '710 reference discloses in Fig. 1 a glass bulb having a thickness of the effective display area of the face plate which is not at all uniform (i.e., it increases gradually from the center to the periphery).

Accordingly, reconsideration and withdrawal of the rejection of claims 10 and 12 under 35 U.S.C. 102(b) based on the JP '710 reference are respectfully requested.

The Rejection of Claim 5 Based on JP '710 in View of Robinder '868

Claim 5 stands rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over the JP '710 reference in view of Robinder (U.S. Patent No. 3,873,868). Claim 5 has been amended to depend upon claim 10. The Examiner relies upon Robinder for a teaching of the claimed multiple layered resin film bonded to the external surface of the face plate of the glass bulb. To the extent that this rejection might still be applied to claim 5 as amended, it is respectfully traversed for the following reasons.

The JP '710 reference fails to anticipate the independent base claim 10 for the reasons stated above (i.e., the JP '710 reference does not teach a color selection mask having a larger curvature than the internal surface of the face plate). Robinder does not remedy the deficiencies in the teachings of the JP '710 reference, as applied to claim 10. Accordingly, it is respectfully submitted that claim 5 is allowable for at least the reason that it depends upon allowable claim 10. Reconsideration and withdrawal of the rejection of claim 5 are therefore respectfully requested.

The Rejection of Claim 8 Based on JP '956 or JP '561 in View of Robinder '868

Claim 8 stands rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over either the JP '956 reference or the JP '561 reference in view of Robinder. The Examiner relies upon Robinder for a teaching of the claimed multiple layered resin film bonded to the external surface of the face plate of the glass bulb. To the extent that these rejections might still be applied to claim 8 as amended, they are respectfully traversed for the following reasons.

The JP '956 and JP '561 references each fail to anticipate the independent base claim 7 for the reasons stated above. Robinder does not remedy the deficiencies in the teachings of the JP '956 and JP '561 references, as applied to claim 7. Accordingly, it is respectfully submitted that claim 8 is allowable for at least the reason that it depends upon allowable claim 7. Reconsideration and withdrawal of these rejections of claim 8 are therefore respectfully requested.

The Rejection of Claims 6 and 9 Based on JP '710 in View of Shiohara et al. '145

Claims 6 and 9 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over the JP '710 reference in view of Shiohara et al. (U.S. Patent No. 5,396,145). The Examiner contends that the JP '710 reference discloses the claimed invention, except for the particular structure of the claimed color selection mechanism. The Examiner relies upon Shiohara et al. for a teaching of the claimed color selection mechanism. To the extent that this rejection might still be applied to claims 6 and 9 as amended, it is respectfully traversed for the following reasons.

Claim 6 depends upon independent claim 10, and claim 9 depends upon independent claim 7. As explained above, the JP '710 reference lacks certain features

which are included in the Applicants' base claims 7 and 10. For example, claim 7 recites a CRT having a glass bulb with both an external surface and an internal surface of an effective display area that are substantially flat, and an effective display area that is substantially uniform in thickness. In contrast, Fig. 1 of the JP '710 reference teaches a CRT having an effective display area with a curved internal surface and a gradually increasing thickness from a center to an outer periphery. The structure disclosed in the JP '710 reference is therefore quite different from the CRT claimed in the Applicants' claim 7.

With regard to claim 10, the Applicants' claimed CRT includes, among other things, a color selection mask having a projected curvature which is larger than the recessed curvature of the internal surface of the face plate. As explained above, the JP '710 reference lacks any teaching or suggestion of the color selection mask 2 having a curvature that is "larger" than the curvature of the concave internal surface 3 of the face plate.

In addition to these deficiencies in the teachings of the JP '710 reference, it is also noted that the Shiohara et al. fails to disclose a color selection mask having the features recited in the Applicants' claims 6 and 9. Specifically, Shiohara et al. fails to disclose a color selection mask in which the pitch of apertures between a plurality of fine metal leads is gradually widened toward a peripheral area in a horizontal direction.

Shiohara et al. discloses an aperture grill 10 that has a plurality of parallel, vertical slits 11 having the same width and spacing across the effective viewing area of the CRT. An additional slit 12a is provided outside the end slit 11a of the plurality of slits 11, which has a smaller width than the other slits 11. However, the additional slit 12a with a reduced width is provided outside the effective area of the picture and serves only as a

“dummy slit” to facilitate assembling the aperture grill 10. There is no teaching or suggestion in Shiohara et al. of gradually widening the pitch of the slits 11 toward a peripheral area, as claimed by the Applicants.

Accordingly, reconsideration and withdrawal of the rejection of claims 6 and 9 under 35 U.S.C. 103(a) based on the combined teachings of the JP ‘710 reference and Shiohara et al. are respectfully requested.

The Rejection of Claims 11 and 13 Based on JP ‘710 in View of JP ‘956

Claims 11 and 13 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over the JP ‘710 reference in view of the JP ‘956 reference. The Examiner contends that the JP ‘710 reference discloses the claimed invention, except for the particular structure of the claimed color selection mechanism. The Examiner relies upon the ‘JP ‘956 reference for a teaching of the claimed structure of the color selection mechanism. To the extent that this rejection might still be applied to claims 11 and 13 as amended, it is respectfully traversed for the following reasons.

Claim 11 depends upon independent claim 10, and claim 13 depends upon independent claim 12. As explained above, the JP ‘710 reference lacks certain features which are included in the Applicants’ base claims 10 and 12. For example, the Applicants’ claimed CRT recited in claim 10 includes, among other things, a color selection mask having a projected curvature which is larger than the recessed curvature of the internal surface of the face plate. As explained above, the JP ‘710 reference lacks any teaching or suggestion of the color selection mask 2 having a curvature that is “larger” than the curvature of the concave internal surface 3 of the face plate.

With regard to claim 12, the Applicants' claimed CRT includes, among other things, a CRT having a glass bulb with an external surface of an effective display area that is substantially flat, and an effective display area that is substantially uniform in thickness. In contrast, Fig. 1 of the JP '710 reference teaches a CRT having an effective display area with a gradually increasing thickness from a center to an outer periphery. The structure disclosed in the JP '710 reference is therefore quite different from the CRT claimed in the Applicants' claim 12.

The teachings of the JP '956 reference fail to remedy these deficiencies of the JP '710 reference. Accordingly, reconsideration and withdrawal of the rejection of claims 11 and 13 under 35 U.S.C. 103(a) based on the combined teachings of the JP '710 reference and the JP '956 reference are respectfully requested.

The Rejection of Claims 14 and 15 Based on JP '710 in View of Okada et al. '322

Claims 14 and 15 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over the JP '710 reference in view of Okada et al. (U.S. Patent No. 4,537,322). The Examiner contends that the JP '710 reference discloses the claimed invention, except for the claimed thickness of the face plate being greater at the peripheral area and thinner at the center according to the relationship recited in claim 14. The Examiner relies upon Okada et al. for a teaching of this feature. This rejection is respectfully traversed for the following reasons.

Claim 14 recites, among other things, the following dimensional relationship of the claimed face plate of the glass bulb of the cathode ray tube:

a thickness T of a peripheral area in a horizontal direction of the effective display area of the face plate is selected as $T = 1.2T_o$ to $1.3T_o$, where T_o is a thickness of a center of the effective display area.

This feature of the claimed invention, when combined with the substantially flat external surface of the effective display area of the face plate, provides superior effects as compared to the combined teachings of the cited references. Specifically, as regards the inner surface of the face plate of the present invention, even if the thickness at the peripheral part in the effective screen region in a horizontal direction is made thicker than the thickness of the central part by 20 to 30% (for example, 3 to 5 mm), there occurs a phenomenon in which the peripheral part is seen in a slight floated state due to an effect of refraction, resulting in the face plate being seen with bare eyes as a substantially flat surface. Further, since the thickness of the peripheral part in the effective screen region of the face plate in a horizontal direction is thicker than the thickness at the central part in the effective screen region, a so-called "arch" effect is produced, resulting in an increased durability of the glass panel against a mechanical shock applied from outside, and an increased anti-explosion strength results without increasing an entire thickness of the face plate.

The JP '710 reference discloses a glass bulb in which the outer surface of the face plate in the effective screen region is substantially a flat plate, and the inner surface has a concave curvature directed toward the color selection mask. However, the JP '710 reference does not disclose a thickness of the face plate being within the range defined by the following relationship stated in the Applicants' claim 14:

$$T = 1.2T_o \text{ to } 1.3T_o$$

Instead, JP '710 describes a glass thickness at each of the center of the effective screen part of the face of the glass panel and the location near its end part, referred to as t_o and t_d , respectively, that fits the following relationship:

$$1.0 \leq t_d/t_o \leq 1.2$$

In JP '710, the thickness t_d is measured at one of the four corners, and the thickness t_o is measured at the center of the face 7. Thus, the relationship of the thicknesses t_d and t_o defined in JP '710 has little relevance to the Applicants' claimed relationship of thicknesses, which are measured at the center and a peripheral area in a horizontal direction. That is, the thickness of the glass bulb at the central peripheral part in a horizontal direction is thinner than a thickness at each of the four corners, making the stated thickness relationship in the JP '710 reference inapplicable to the present invention. The present invention defines a relationship in which the thickness at the central peripheral part of the face plate in a horizontal direction is 20 to 30% greater than the thickness at the center of the face plate, while the JP '710 reference teaches a thickness at the peripheral area in a horizontal direction which is less than 20% greater than the thickness at the center of the face plate.

Okada et al. discloses a cathode ray tube having a glass panel section with a face plate of substantially rectangular shape with inner and outer surfaces. The radii of curvature of the inner and outer surfaces are such that a thickness of the face plate increases from a center to the peripheral area in a horizontal direction. The thicknesses of the face plate in Okada et al. appear to fall within the claimed relationship of the thickness at the central peripheral part in a horizontal direction being 20 to 30% greater than the thickness at the center of the face plate. However, Okada et al. does not disclose an external surface of an effective display area of the face plate being substantially flat. Thus, Okada et al. has little relevance to the Applicant's claimed invention, which requires that the external surface of the effective display area of the face plate be substantially flat.

The combination of a substantially flat external surface of the face plate and the face plate having thicknesses that fall within the claimed relationship stated in claim 14

provides a unique and highly advantageous structure as compared to the prior art. The relative thicknesses taught by Okada et al. for a face plate having a substantial curvature on its external surface does not teach or suggest that such thicknesses would be at all suitable for a CRT having a face plate with a flat external display surface.

Accordingly, reconsideration and withdrawal of the rejection of claims 14 and 15 under 35 U.S.C. 103(a) based on the combined teachings of the JP '710 reference and Okada et al. are respectfully requested.

The Rejection of Claim 16 Based on JP '710 in View of Okada et al. '322

Claim 16 stands rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over the JP '710 reference in view of Okada et al., as applied to claim 14, and further in view of the JP '956 reference. The Examiner contends that the JP '710 reference discloses the claimed invention, except for the color selection mask having a pitch between adjacent apertures that gradually widens toward a peripheral area. The Examiner relies upon the JP '956 reference for a teaching of this feature.

This rejection is respectfully traversed for at least the same reasons stated above regarding the rejection of independent claim 14, upon which claim 16 depends. The teachings of the JP '956 reference do not remedy the deficiencies described above in the combined teachings of the JP '710 reference and Okada et al. Accordingly, reconsideration and withdrawal of the rejection of claim 16 under 35 U.S.C. 103(a) based on the combined teachings of the JP '710 reference, Okada et al., and the JP '956 reference are respectfully requested.

New Claims 17 to 19

New claims 17 to 19 have been added to claim the Applicants' invention in a slightly different manner for the Examiner's consideration. Regarding claim 17, the JP '710 reference fails to disclose explicitly that the face plate is visually flat by means of the refraction effect, as shown in Fig. 3 and described in paragraph [0016] of the JP '710 reference. Instead, the JP '710 reference teaches that an external surface of an effective display area of a face plate in the JP '710 reference should be concave shape to make the face plate visually flat by means of the refraction effect, as distinctly described in paragraph [0017] of the JP '710 reference.

On the contrary, the Applicants have developed a CRT having a unique relationship of the thickness between a peripheral area and a center area in a horizontal direction of the effective display area of the face plate, which leaves the external surface of an effective display area of a face plate to be substantially flat. The Applicants' invention claimed herein has achieved much commercial success in the industry, and the invention has received a number of awards and has set trends for many competitors in the flat CRT TV market.

Conclusion

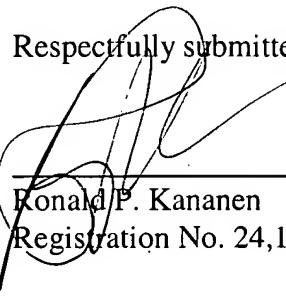
Applicants respectfully submit that all of the pending claims 5 to 19 are now in condition for allowance, and request that a timely Notice of Allowance be issued for this reissue application.

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If the Examiner has any comments or suggestions that could place this resissue application into even better form, the Examiner is encouraged to contact the Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,


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